REMARKS

Claims 76-117 are currently pending. Claims 1-75 and 115 are canceled and Claims 89 and 103-111 are withdrawn. Claims 76, 87, 88, 89, and 112 are amended herein.

Restriction Requirement/Election of Species

Applicants affirm the election, without traverse, of Claims 76-102 and 112-117, and the species of $HfCl_4$. Applicants respectfully request reinstatement of the non-elected invention now that generic claims are allowable as set forth below.

Rejections Under 35 U.S.C. §112

Claims 87, 88, and 90-102 are rejected under 35 U.S.C. §112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter with applicant regards as the invention. Claims 87 and 88 have been amended to particularly point out and distinctly claim the subject matter with applicant regards as the invention. These amendments overcome the rejection under 35 U.S.C. §112, second paragraph, of Claims 87, 88, and 90-102.

Rejections Under 35 U.S.C. §102/§103

Claims 76-78, 81, 83, and 85 are rejected under 35 U.S.C. §102(e) as anticipated by or, in the alternative, under 35 U.S.C. §103(a) as obvious over Lei, U.S. Patent No. 6,718,126. Claims 84, 86, 87, 90, 91, 93, 94, and 96-98 are rejected under 35 U.S.C. §103(a) as being unpatentable over Lei, U.S. Patent No. 6,718,126. Claims 79 and 80 are rejected under 35 U.S.C. §103(a) as being unpatentable over Lei in view of Raaijmakers, U.S. Publication No. 2001/0024387. Claims 82, 83, and 94-102 are rejected under 35 U.S.C. §103(a) as being unpatentable over Lei in view of Tasaki, U.S. Patent No. 5,904,771. Claim 88 is rejected under 35 U.S.C. §103(a) as being unpatentable over Lei in view of Londergan et al., U.S. Patent No. 6,720,259. Claims 92 and 96-98 are rejected under 35 U.S.C. §103(a) as being unpatentable over Lei in view of Onoe, U.S. Patent No. 6,270,839.

Claims 76 and 87 have been amended to recite a flowable support medium configured to facilitate saturated pulsing of a carrier gas. Claim 87 has also been amended to recite an atomic

layer deposition (ALD) chamber downstream of the support medium. These amendments are fully supported by the specification as originally filed at, for example, paragraphs [0067] - [0070].

None of Lei, Raaijmakers et al., Longerdan et al., Onoe et al., and Tasaki, either alone or in combination, teaches or suggests a flowable support medium configured to facilitate saturated pulsing of a carrier gas and an atomic layer deposition (ALD) chamber downstream of the support medium, as recited in Claims 76 and 87, as amended. The support medium 6 in Lei is ***not flowable*** and Lei does not teach or suggest saturated pulsing of the carrier gas. Raaijmakers et al. teach pulsed deposition for ALD processing, but do not teach or suggest saturated pulsing of the carrier gas nor do they teach or suggest a flowable support medium. Similarly, Longerdan et al. do not teach or suggest saturated pulsing of the carrier gas or a flowable support medium.

Tasaki discloses a method of subliming material in **CVD** film preparation; therefore it would not have been obvious to provide the Tasaki CVD apparatus with saturated pulsing, as recited in amended Claims 76 and 87. In CVD, the flow of the carrier gas is continuous, not pulsed, such that there is no consideration of the path length, dimensions of the support media in comparison to the duration of pulses and intervening pauses. It would not have been obvious to provide a CVD apparatus with saturated pulsing. Tasaki is silent about and does not teach saturated pulsing, which is desirable in **ALD** although not commonly recognized. In fact, the only discussion in Tasaki about saturation is an assumption of saturation based solely on a relatively constant deposition rate for a given carrier gas flow rate (*see* Fig. 5 and Col. 6, lines 9-12). Onoe et al. similarly disclose a CVD apparatus and does not teach of suggest saturated pulsing in ALD.

Claims 76 and 87, as amended, are therefore patentable as they are not anticipated by or obvious in view of any of Lei, Raaijmakers et al., Longerdan et al., Onoe et al., and Tasaki, either alone or in combination. Claims 77-86 and 88-102, which depend from and include all of the limitations of Claim 76 or 87, as amended, are therefore also patentable. Furthermore, each of the dependent claims recites further distinguishing features of particular utility.

Claims 112-117 are rejected under 35 U.S.C. §102(b) as being anticipated by or, in the alternative, under 35 U.S.C. §103(a) as obvious over Gartner et al., U.S. Patent No. 4,883,362. Claims 112-114 are rejected under 35 U.S.C. §102(b) as anticipated by or, in the alternative,

under 35 U.S.C. §103(a) as obvious over Wen et al., U.S. Patent No. 5,553,395. Claims 112-117 are rejected under 35 U.S.C. §102(b) as anticipated by or, in the alternative, under 35 U.S.C. §103(a) as obvious over Gregg et al., U.S. Publication No. 2004/0016404. Claim 112 has been amended to recite that the guidance structure comprises a plurality of stacked trays partially defining levels of the helical pathway. This amendment is fully supported by the specification, as originally filed at, for example, paragraphs [0098]-[0102], and Fig. 18. Claim 115 has been canceled.

None of Gartner et al., Wen et al., and Gregg et al. teaches or suggests a carrier gas guidance structure comprising a plurality of stacked trays partially defining levels of the helical pathway., as recited in amended independent Claim 112. The Examiner contends that the "whirlpool effect" of Wen et al. and Gregg et al. inherently causes the gas to flow in a helical path. However, neither Wen et al. nor Gregg et al. teaches or suggests wherein a carrier guidance structure comprising a plurality of stacked trays partially defining levels of the helical pathway, as recited in amended Claim 112. In Gregg et al., the whirlpool effect is effected in *each* of the multiple "pores" between any two trays and does not define a helical pathway through stacked trays. Similarly, neither Wen et al. not Gartner et al. teaches or suggests stacked trays partially defining leveles of the helical patheway, as recited in amended Claim 112. Furthermore, the Examiner contends that Gartner et al. discloses a substantially helical pathway for the carrier gas. However, Applicants respectfully submit that the pathway for the carrier gas disclosed in Gartner et al. is ***spiral*** (*see* Fig. 4 and Col. 6, lines 9-11), not substantially ***helical***, as recited in Claim 112.

Amended Claim 112 is therefore not anticipated by nor obvious in view of Gartner et al. Wen et al., and Gregg et al., either alone or in combination. Claims 113-117, which depend from and include all of the limitations of amended Claim 112, are also patentable over Gartner et al. Wen et al., and Gregg et al. Furthermore, each of the dependent claims recites further distinguishing features of particular utility.

Conclusion

Applicants respectfully submit that all of the pending claims are patentably distinguishable over the prior art of record. The cited references, either alone or in combination, do not teach or suggest Applicants' claimed invention.

Please charge any additional fees, including any fees for additional extension of time, or credit overpayment to Deposit Account No. 11-1410.

Respectfully submitted,

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